British Diabetic Association Guidelines on Genetic and Immune Screening for Type 1 Diabetes Mellitus

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The following article is a report from the Chairman of the Professional Advisory Committee of the British Diabetic Association. The committee, with the help of a number of experts currently working in the field, produced a set of guidelines intended for use by health care professionals on the issues around genetic screening for Type 1 diabetes mellitus. The guidelines were approved by the Board of Management of the British Diabetic Association and we publish them here. © 1998 John Wiley & Sons, Ltd.

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Introduction

In recent years major scientific advances have led to the identification of a number of markers which can accurately identify first-degree relatives of people with Type 1 diabetes who are at risk of developing diabetes themselves. Such tests are likely to be widely available on a commercial basis in the very near future. In addition it is now possible that immune modulation before the onset of symptoms might delay or even prevent the disease occurring. All these factors are likely to lead to an increase in enquiries about screening tests for Type 1 DM.

Genetic Screening

Although genetic associations with Type 1 diabetes have been identified, no one single gene defect or allelic form, or indeed combination of genetic factors, can accurately identify individuals at risk of either Type 1 or Type 2 DM. However, individuals with the HLA allele DQB1*0602 appear to be protected from the development of the former. Genetic screening for Type 1 DM and the vast majority of patients with Type 2 cannot thus be recommended currently. The exception is in maturity onset autosomal dominant diabetes of youth (MODY) where three single gene defects have been identified to date. Genetic testing of MODY families is thus feasible, but should only be offered to family members after careful genetic counselling.

Immune Screening

- Using a combination of autoimmune markers (islet cell antibodies, insulin autoantibodies, GAD 64), it is now possible to identify first-degree relatives of people with Type 1 diabetes who have more than an 80 % chance of developing Type 1 diabetes within 10 years.
- In the general population, screening using these 3 markers has a very low sensitivity and specificity of identifying high-risk individuals.
- Trials of immune modulation using nicotinamide, insulin and cyclosporin in presymptomatic individuals at high risk of developing Type 1 diabetes are in progress, but there is currently no recognised clinically available intervention which will prevent the onset of symptomatic diabetes.

Summary and Recommendations

1. With the exception of MODY, genetic screening for identifying individuals at high risk of developing diabetes is not helpful.
2. Screening using a combination of autoimmune markers has high sensitivity and specificity of identifying first-degree relatives of people with Type 1 diabetes who are themselves at high risk of the disease. However, screening using such markers is not useful in the general population.
3. Immune screening of first-degree relatives is only useful provided that individuals who screen positive are offered the opportunity of cooperation in intervention studies. Screening should only be undertaken after full counselling and follow-up should be offered.

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